VOCATIONAL TRAINING AND TRADE TEACHING IN THE PUBLIC SCHOOLS

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Certain elements of difficulty present themselves in any discussion of vocational teaching, owing to the fact that the average school officer thinks in this connection of a boy of one age, while the employer or director of a trade school thinks of a boy of a different age. The latter has no suggestion to offer as to the vocational training of the boy before the sixteenth year, while the former is most concerned as to the future of that great army of boys who pass out from the schools at the age of fourteen, whether or not they have reached the highest grammar grade.

The school officer is perturbed when he reflects on the two years which these boys must waste before they can, as apprentices, gain admission to any shop. The average trade school teacher looks with equanimity upon, and at times even commends, this state of affairs, urging that it shows the brightest boys that their advance must depend upon their obtaining more definite and valuable instruction than any they can secure through the indifferent training of the factory. Boys thus convinced of the necessity of trade teaching, and willing to make sacrifices of time and wages that they may spend a year or more in the trade school, form, in the judgment of trade teachers, those most likely to be benefited. Undoubtedly this is in large measure true, but the process is clearly a survival of the fittest, and one repugnant to every teacher genuinely interested in seeking to devise methods of instruction which will serve to promote the retention in school of as large a number of pupils as possible, to the end that each may be schooled to produce his best.

In order to clarify the general discussion, it is therefore to be premised that, as students of various ages must be considered, no one type of school will meet all requirements. Second, it is to

be noted that trade teaching as such, is not to be thought of before the age of sixteen. The uniform experience of trade school teachers as evidenced in the requirements of trade schools, both public and private, makes it plain that the boy before the age of sixteen is not wanted in any shop, and is not physically able to do the work required in a trade school. The writer, called upon recently to review the possibilities of introducing vocational teaching into the public schools of a large city system, prepared a statement from which the following matter is taken.

That which is termed "the curriculum" of the elementary school, lays its chief emphasis on subjects of general culture value. None of the studies, as presented, touches in any direct way the industrial environment of the pupil, nor do the subjects, except in certain phases of the number work, concern themselves directly with problems which appear concrete and useful to one of vocational bent. The course is one dealing much with theory, but comparatively little with practice. It places its emphasis on mental rather than on manual achievement. The pupil who is brilliant mentally, prospers and has his work commended, but the pupil who leans toward vocational work, and who lacks ability or interest in mental performance comes in for serious criticism. As a whole this system stands for a training of the thinker rather than the doer, the time given to manual performance being but a very small fraction of that given to school work as a whole.

The manual training which is now offered in elementary schools is developmental and socializing. Its purpose is a general training, not a special one. Manual training as an element of the elementary curriculum has an important rôle to play, but this rôle is not vocational in character. As a subject, this training is one to be pursued through the entire elementary course. It looks to a general schooling of the pupil in intelligence and skill, and offers its advantages alike to pupils bright and dull. It may properly prepare for further study of an industrial character, but it is not itself to be developed on vocational lines.

Vocational work, on the other hand, should be special and intensive. It should give those pupils who have a general bent toward the arts much direct training in shop methods and shop standards. Vocational training should, therefore, follow the general manual training of the elementary schools. It should rise out

of such training, and look not to general but to special development of the pupil's ability and skill. Manual training is part of a general educational system to be pursued in the early years by all; vocational training is part of a system of industrial education to be pursued by those desirous of entering the trades. The aim of the latter should be to give the pupil insight that will later enable him to make an intelligent choice of some specific vocation.

While, therefore, the manual work of the elementary schools has a distinct function to perform, there is increasing weight of evidence to show that it is not a subject of the elementary school system adapted to meet the vocational needs of its pupils. This need is not to be met by a reorganization of the manual work of the grades, but rather by changes in the system itself, in aspects in which it is inadequate to meet the demands made upon it. In the main our system as differing from that of continental Europe does not take cognizance of the probable destinies of its pupils. Based on principles assumed to be democratic, it makes no distinction of mental capacity and proclivity, but offers the same preparation to those who are to go into the professions and to those who are to enter the commercial and artisan world. That such preparation cannot be uniformly satisfactory is manifest not only from the failure of a large number of pupils to cope successfully with its requirements, but in the complaints of employers that the public school graduate is ill prepared for life as a worker and that he has by the schools rather been trained away from that life than toward it.

Large numbers of pupils leave the elementary school before completing the course. These will be found chiefly in two classes. First, those who are not mentally equipped to complete the work as at present arranged for the higher grades, and second, those with strong vocational inclination who are dissatisfied with the school's curriculum, and seek the first opportunity to enter on a vocational career. The former pupils are the so-called over-age children of the lower grades. Slower than their mates, they take as early an opportunity as possible to secure their work-papers and leave the field of their unsuccessful effort.

But once out in the industrial field the boy from fourteen to sixteen finds that he is not wanted as an apprentice or learner in any trade. He is too immature physically to meet the demands made upon the adult in the factory or the shop. If admitted it is only to

serve as errand boy or as assistant in the performance of some routine of unimportant mechanical work, but as errand boy, feeder or helper he receives practically no instruction and is paid a very trifling wage. There is a serious economic loss both to state and worker under these conditions. The boy has lost school training on the one hand and is unable to recompense himself by adequate technical instruction on the other. With such defective preparation it is not to be expected that he will develop into a workman of great value.

The recent well-known report of the Industrial Commission of the State of Massachusetts stated that 25,000 children were found to be in the vocational field between the ages of fourteen and sixteen. Most of these children were drifting about from one position to another in the endeavor to secure some permanent foothold. In the words of the compilers of the report: "For the great majority of children who leave school to enter employments at fourteen and fifteen, the first three or four years are practically waste years, so far as the productive value of the child, and so far as increasing his industry and productive efficiency are concerned. The employments upon which they enter demand so little individual skill that they are not educative in any sense."

From this statement it might be inferred that the most important part of industrial teaching dealt with pupils between the ages of fourteen and sixteen—the "waste years." In reality the question is one which should deal with the pupil before the age of fourteen, for, unless he has received some definite vocational interest and bent before he has reached the limits of his compulsory schooling, he leaves the elementary school without insight or training in any of the things which make for the successful choice and pursuit of a vocation.

While therefore trade teaching as such cannot be advocated for the immature pupils of the elementary school, *preparatory vocational training* must come to be seen as a necessary preliminary to the development of what may be termed the clientele of the trade school. The years for such training are the sixth, seventh and eighth years of the elementary school course, and the two years immediately succeeding. The first three of these are the years when the pupils are most prone to leave school, while the last two form the period when his services in the trade are as yet undesired. By

the sixth year the mental capacity and bent of the pupils may be determined. If those who lean toward vocational work can have their interests met at this stage, it may reasonably be expected that a very considerable number of them will be induced to remain in the school through the period of the usual elementary schooling, while many will in addition continue for one or more of the secondary years if these offer instruction particularly planned for the vocationally inclined.

It is believed that the condition most essential to the success of a school planned to give this vocational training will depend on its establishment as a new and separate unit in the school system, one officered by a corps of instructors especially chosen because of their vocational knowledge and specific interest in the form of instruction to be given. The school should be one planned to perform a particular service. It should offer to the pupils the definite aim of vocational preparation, beginning some time before the completion of their compulsory school period, and by the practical nature of its teaching striving to hold them after such period through the critical two years which follow. If the course of study is so organized, difficulties will be obviated, which would inevitably affect the success of a plan giving vocational training in the higher years of the elementary school, as at present organized, or in the lower years of a high school course, extended downward into the grades. In either case the vocational work would be incidental to the general curriculum, tacked on and loosely articulated with the regular course of study. The preparatory vocational school demands, on the contrary, that the vocational subjects be the center and core of its teaching. Both pupils and parents must see the school as one giving a preparation so direct and valuable to the future worker in the trades, that its graduate may count upon his knowledge as an immediate asset in securing him a shortened apprenticeship, and a speedier advance in wages.

Entrance into the preparatory vocational school should naturally be offered as an elective, that is, the school should be organized in any district in a city in which the defection in the sixth and seventh years is now most marked, and should offer its courses to those pupils only who might choose to follow its curriculum rather than that of the grades as at present arranged.

Curriculum for Vocational Schools

The curriculum of the vocational schools should require considerable training in hand work during the first year with additional emphasis on this work in the succeeding years. With this hand work there should be offered related lessons in English, geography, history, physics, arithmetic and drawing. Shop discipline and methods should form an important element in the practical work, and visits to shops in operation should be required. All of the subjects should be developed from the vocational point of view with particular emphasis on the parts they have to play in furthering the student's practical knowledge of the industrial world. While the students might be called upon for a comparatively small amount of home work, it is believed that they would profit by a school day longer than now required. In any occupation their services would be demanded at least eight hours a day. In the vocational school they might well be required to receive seven hours of instruction and practice each school day. So arranged and without being unduly fatiguing, the course would offer an extended and valuable training in both theory and practice. In the technical branches the teachers should be especially qualified by actual trade experience. They should be skilled workmen of high intelligence, that they might be able to hold up before their boys the best standards of the crafts.

In the first year of the proposed school the shop work should aim to familiarize the pupils with the use of woodworking tools and with the handling of simple pieces of machinery like the speed lathe. In the second year it would also be possible to offer work in metal both in the form of chipping and filing at the vise and in the working of brass at the speed lathe. The great accuracy that is required in the metal work, and its fundamental relation to many mechanical operations, would make it a highly useful method of introducing the pupil to representative forms of industrial practice. It is to be noted that all the different types of work suggested are within the physical ability of the pupils between the ages of eleven and fourteen.

In the higher years of the vocational school it would be necessary to differentiate the departments of instruction to the end that the student might elect to pursue his vocational work along the lines

of woodworking or machine shop practice, electrical work, etc. In the extended development of several of these preparatory vocational schools, it would undoubtedly be of advantage to organize each school to lead to a particular group of industries. One might prepare apprentices for the building trades, another for the metal working trades, a third for the printing trades, and so on. The satisfactory differentiation of the work in the higher grades of the vocational school is a matter only to be determined by trial and experimentation. It must, however, be carefully noted that the school proposed should not undertake to graduate pupils equipped to enter the trades in any capacity save that of an apprentice already considerably advanced in technical knowledge, and possessed of skill sufficient to enable him quickly to assimilate the particular knowledge of any specialized industry rising out of the course he has followed.

It is assumed that with this knowledge and skill the advantage of a shortened apprenticeship will be offered to the graduate. In view of the almost uniform statements of employers this belief is held justifiable. In any large city it may safely be premised that a number of employers will be found willing to accept the vocational school graduate, and to advance him more rapidly in his apprenticeship than the unskilled applicant who enters without knowledge or insight into processes and without training preparing him to adapt himself readily to the different forms of work required of the learner. The immediate coordination between the vocational school and employers is a necessary and purposed part of the plan proposed. It would act directly to interest a large number of practical men in the work of the schools, while it offered to the pupil the stimulus which comes from a realization that, on the completion of his course, he will be put immediately in the way of entering on his chosen vocation under conditions more favorable than could otherwise be the case.

Another important element commending a school looking only to the preparation of the apprentice for his apprenticeship, is the fact that it will not act to arouse the opposition of organized labor, which looks with suspicion on any scheme which undertakes to throw upon the labor market many young and indifferently skilled artisans whose number and whose willingness to accept employment at less than the usual wage, tend to lower the standard of living for all workmen in the trade.

Trade Teaching for Those Already in the Trade

Two types of schools would serve to give trade instruction to those already engaged as apprentices. One of these exists in the form of evening classes, as at present organized, in machine shop practice, plumbing and carpentry in the manual training high schools of various cities. Fully developed, an evening school of this kind would offer a number of different courses of a very practical nature, each planned to forward the student as rapidly as possible through operations designed to acquaint him with the use of tools and machines with which as an apprentice he would become very slowly familiar in the routine of the factory. The evening trade school should seek to shorten the apprenticeship of the worker by advancing him to a broad knowledge of the technique of his vocation. It should supplement mechanical exercises with explanations as to the reasons for each operation, the theory on which it is founded, and the material with which it deals. Emphasis is laid on the fact that students in this school should be actually at work in the trade, putting into daily practice the knowledge which they gain at night. This knowledge should be supplementary to the practical work of the shop; it cannot take the place of this work.

In connection with the above plan very valuable teaching might be done by offering, from time to time, brief courses designed to give instruction in some special feature of a single trade. These courses, properly advertised among the apprentices of that trade, would undoubtedly serve to attract a number who might be prepared to attend for a limited number of weeks, though they might not be in a position to take a more lengthy and elaborate course of instruction. It is urged that serious consideration be given to this plan for developing short evening school courses of a highly specialized nature. As a method of supplementary trade teaching it has much to commend it.

The second type of trade school designed to assist apprentices in the trade is the so-called "Partial-time school." This has been repeatedly advocated, but it is believed has not as yet been fully developed, except in the Cincinnati School of Engineering, where there are a number of students now taking a six-year course, three years of which are in the laboratories of the school and in the various shops in the city. In this school the student is required to

work alternate weeks at the university and in the machine shop. The latter pays him for his time, and the wages earned amount in six years to $2,000.

Continuation Schools for Apprentices

In addition to direct trade teaching, "continuation instruction" should be offered to apprentices desirous of furthering their general knowledge of subjects not immediately vocational, but intimately related to their successful training as artisans. This instruction should be given in evening schools in the form of industrial mathematics, drawing, economics, etc. In pursuit of this plan it would be entirely possible to develop a continuation evening school for those in the machine trades and another for the building trades, a third for those practicing the arts, and a fourth whose work brought them into the widening field of chemistry and electricity.

Mention should also be made of the plan now in operation in Chicago of offering day continuation schooling to carpenters' apprentices for four months each winter. In a report on this Chicago day apprentice school, rendered by the principal, William J. Bogan, in 1906, it was noted that the daily average attendance for the term was 228, the average age of the pupils being nineteen years. The instruction given included work in English, arithmetic and industrial drawing. The carpenters' union exacts fines of apprentices who do not attend. The school has already had a measure of success, its most noteworthy feature appearing in the willingness on the part of the unions to aid in raising the standards of intelligence of their workmen. With further experience and the inclusion of courses that would make strong practical appeal to the apprentices, there would seem to be good ground for a belief that this day continuation school will come to occupy a permanent place in every scheme of trade teaching. An important element in the plan is the fact that the apprentices in the Chicago school are paid by their employers while in attendance.

The Day Trade School

No discussion of this subject should be closed without reference to the plan recently adopted in Milwaukee. In this city a trade school was opened in January, 1906, by the Merchants' and Manufacturers' Association. Short trade courses were organized offering

five months in plumbing and a ten-months' course in pattern-making, foundry work, machine work and toolmaking.

The minimum age of admission in the Milwaukee school is sixteen years, and the candidate must have had school training equivalent to at least eight years in the public schools. Since the opening of the school it has been incorporated into the public school system of the city, but it remains to be seen whether it can successfully be developed as a part of that system. The work it offers resembles in some respects that recommended for the last two years of the preparatory vocational school, but differs from the latter in the requirement that the pupils must have reached sixteen years of age before entrance, and in the emphasis that it places upon the intensive study of the mechanics of a single trade.

If, as observed in the case of the preparatory vocational school, this school of the trades avoids offering its graduates as completely equipped apprentices prepared to undertake journeyman's work it will escape the otherwise inevitable opposition of organized labor. If, on the other hand, its graduates do not become regular apprentices after leaving the school, but are exploited by employers in competition with the rank and file of the wage earners, then the systematic opposition of labor will be likely, in time, seriously to curtail its activities. Finally, it should be noted that, though this school develops in the most successful manner, it never can be more than the capstone of a system which should begin with pupils several years younger. Undertaking trade teaching, it properly limits the age of those who enter to sixteen years, but, as has been previously stated, the important problem of the elementary school is that which seeks a method of training pupils beween the age of twelve and sixteen. It may be definitely asserted that no trade school, organized as such, can adequately solve this problem; its solution lies in the development of the preparatory vocational school.